



USMC Initiatives in Energy and Power

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Report Documentation Page

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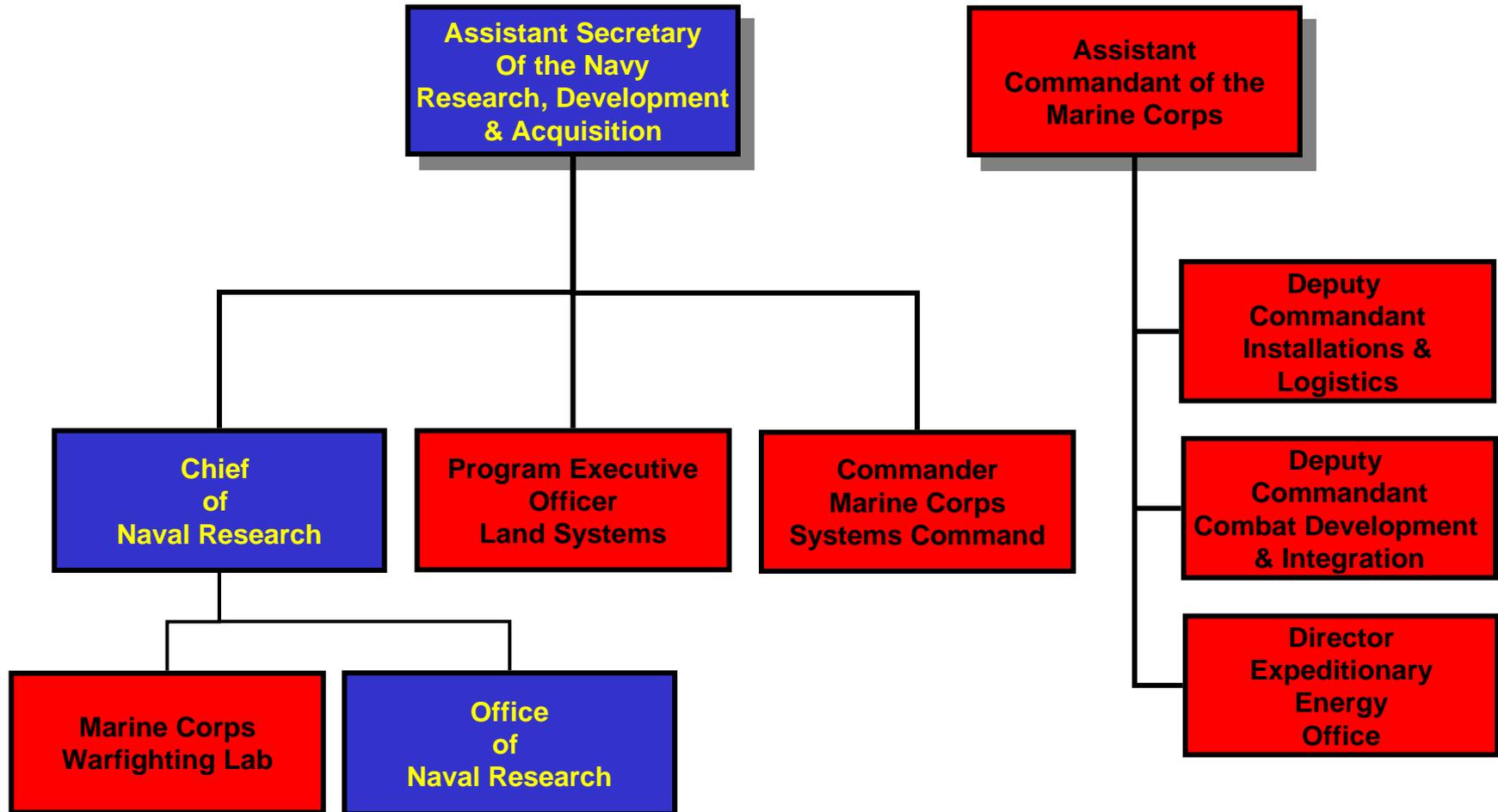
Discussion Topics



- **USMC Organizations in Power & Energy**
- **Key Power and Energy Drivers**
- **Naval Lithium Battery Safety Program**
- **Business Opportunities**
- **Acquisition Programmatic Considerations**

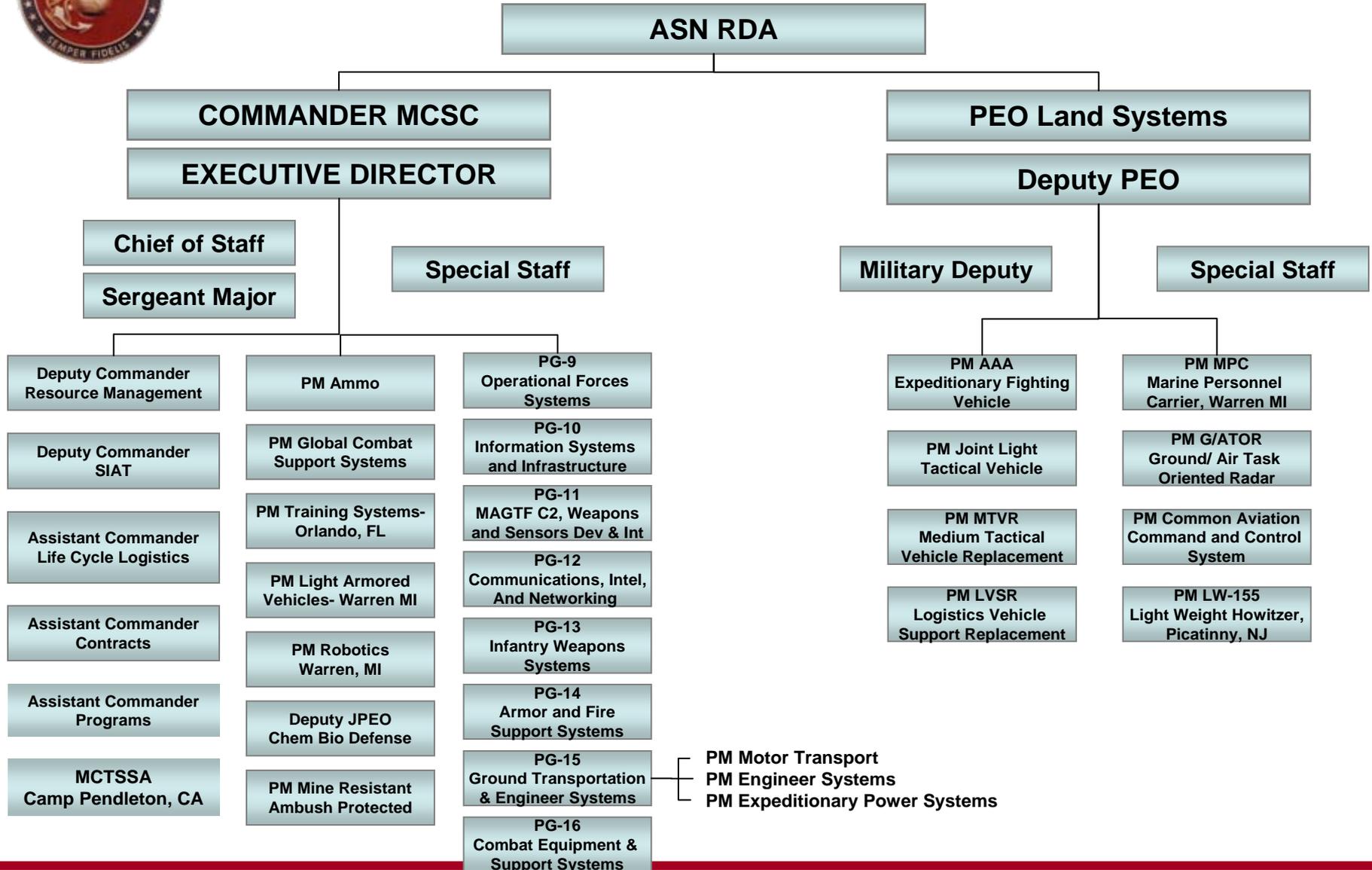


USMC Organizations in Power and Energy



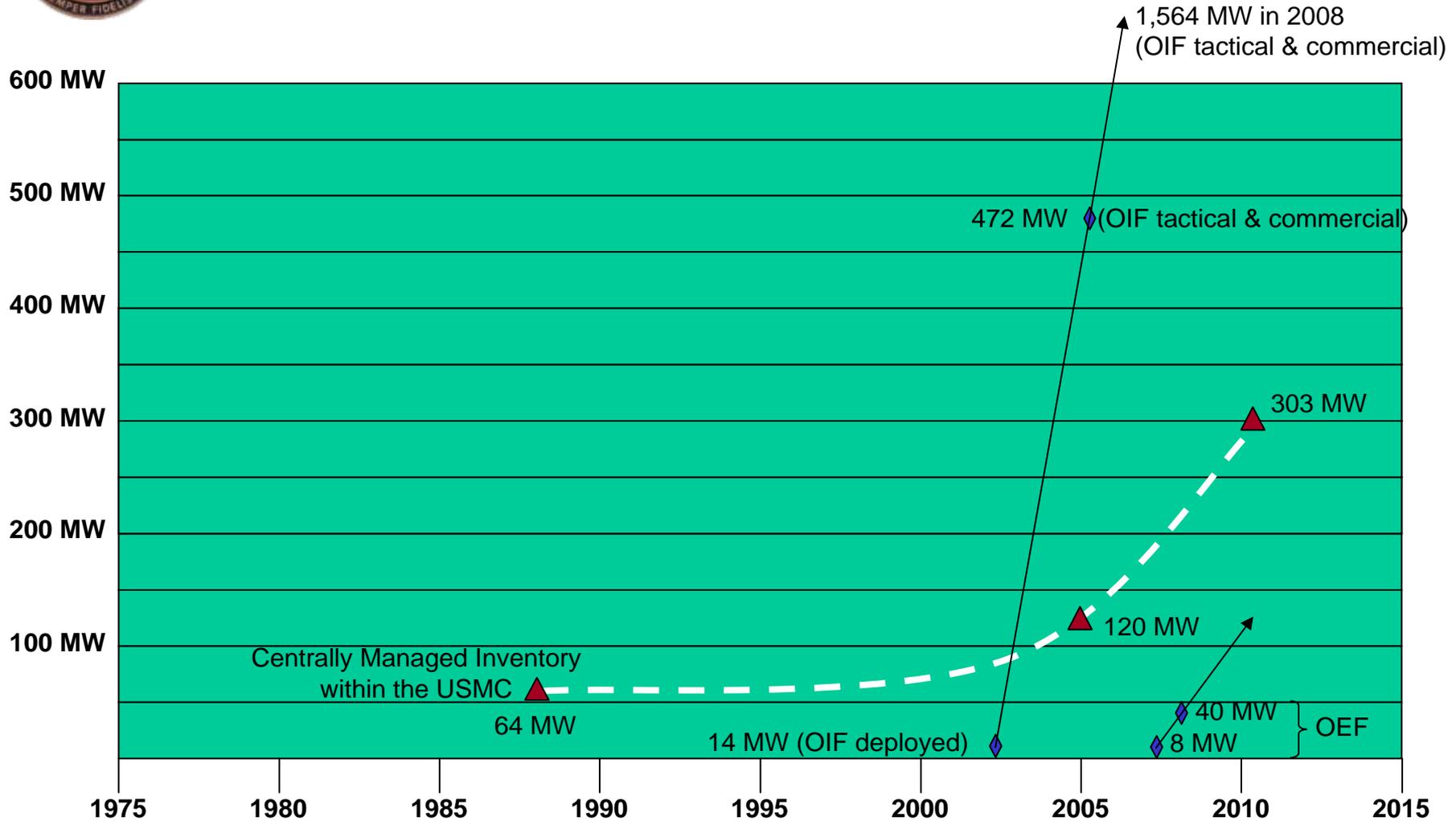


USMC Acquisition Organizations





USMC Power Generation Capability





Individual Power Needs



AN / PVS-17
AA Battery



AN / PVS-14
AA Battery



AN / PAS-13D
AA Battery



AN / PEQ-16A
DI-123A Battery



Hand-held flashlight
AA Battery



MIOX Water Purifier
AA Battery



AN / PSC-13 D-DACT
Unique or AA Battery



DAGR
AA Battery



AN / PRC - 148 or 152
Unique Batteries



AN / PRC-153
Unique Battery



Quiet Pro Headset
Unique Battery



Squad Digital Camera
Unique Battery



AN / PRC-117F
BA-5590 / BA-5390 / BB-2590 Batteries

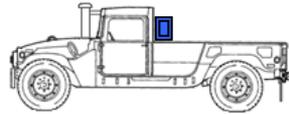


Rugged Laptop
Unique Battery



Pre-OIF Radio Density

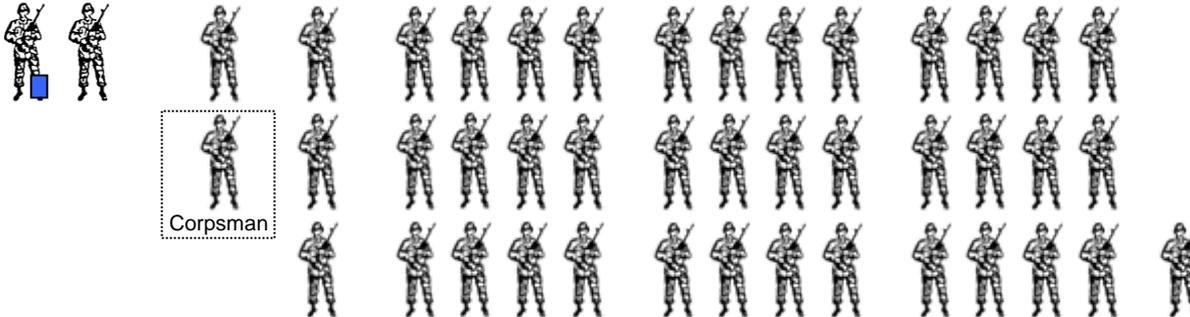
Co HQ (x3/Bn)



Mounted in M998A1

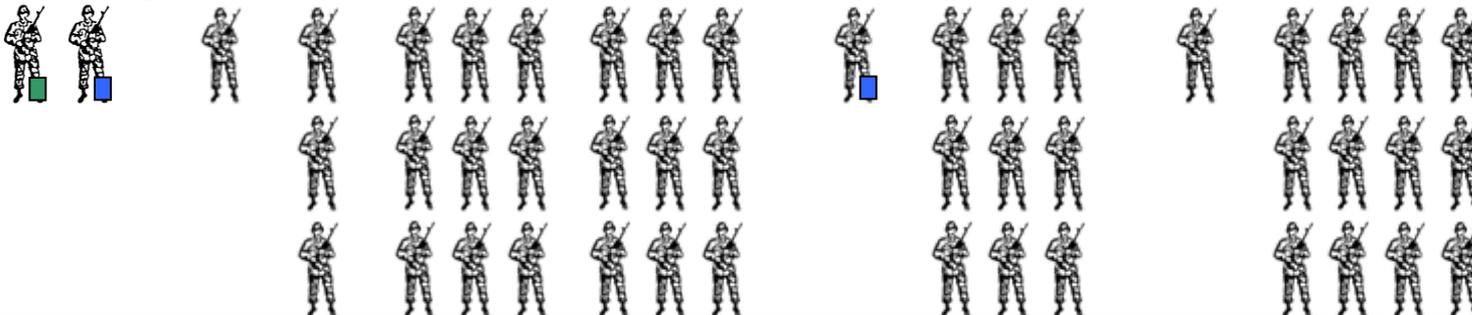
T/O 6 Officer/176 Enlisted	
	VHF-V (VRC-88): 1
	VHF-M (PRC-119): 7
	UHF-M (PRC-113): 1

RFL Plt (x3/Co x9/Bn)



Radio Weights	
PRC-119	- 22.5 lbs
PRC-113	- 16.7 lbs
* w/batteries	

WPNS Plt (x3/Bn)



MG Sect

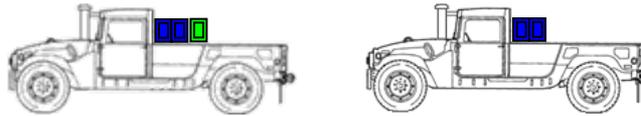
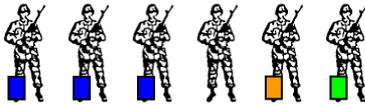
Mortar Sect

Assault Sect



Tactical Communications Modernization

Co HQ (x3/Bn)

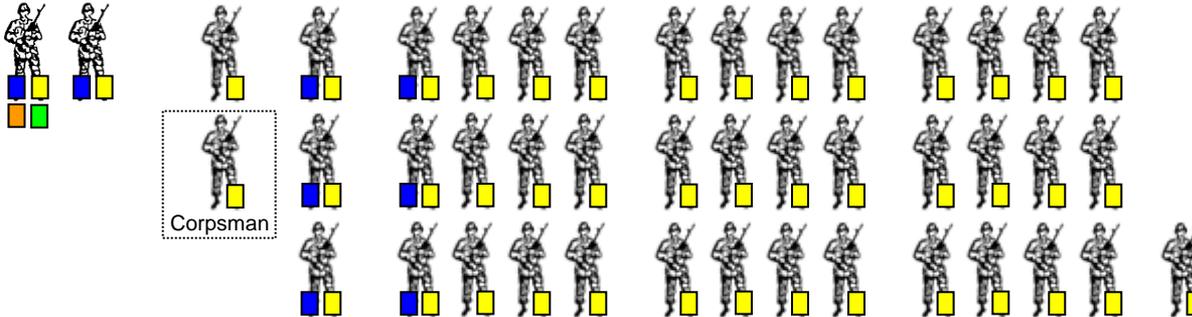


Mounted in M1123A2s

T/O	6 Officer/176 Enlisted
	MBR-V (VRC-103): 1
	MBR-M (PRC-117): 6
	HFMR (PRC-150): 5
	DVA (VRC-110): 2
	THHR (PRC-148/152): 35
	IISR (PRC-153): 176

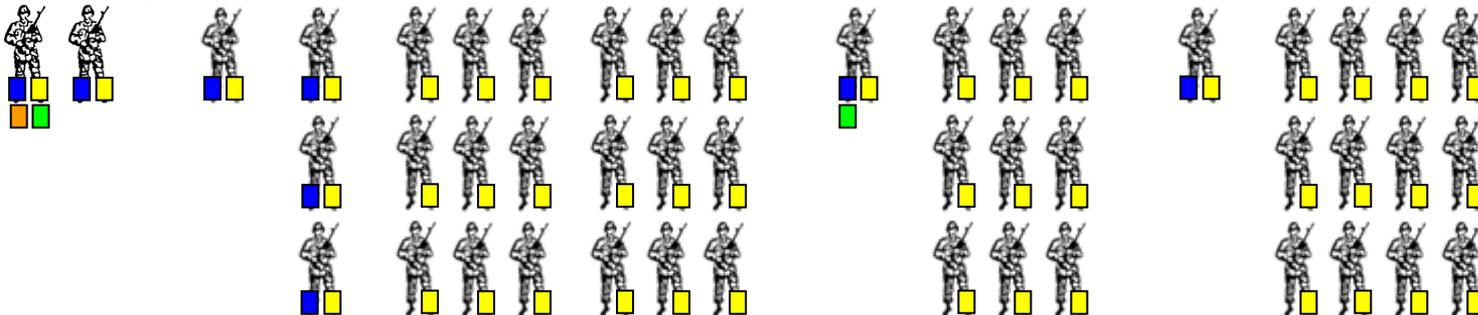
*Corpsman IISR counted in H&S

RFL Plt (x3/Co x9/Bn)



<u>Radio Weights</u>	
PRC-150	- 15.7 lbs
PRC-117	- 15.9 lbs
PRC-152	- 2.4 lbs
PRC-153	- 1 lbs
* w/batteries	

WPNS Plt (x3/Bn)



MG Sect

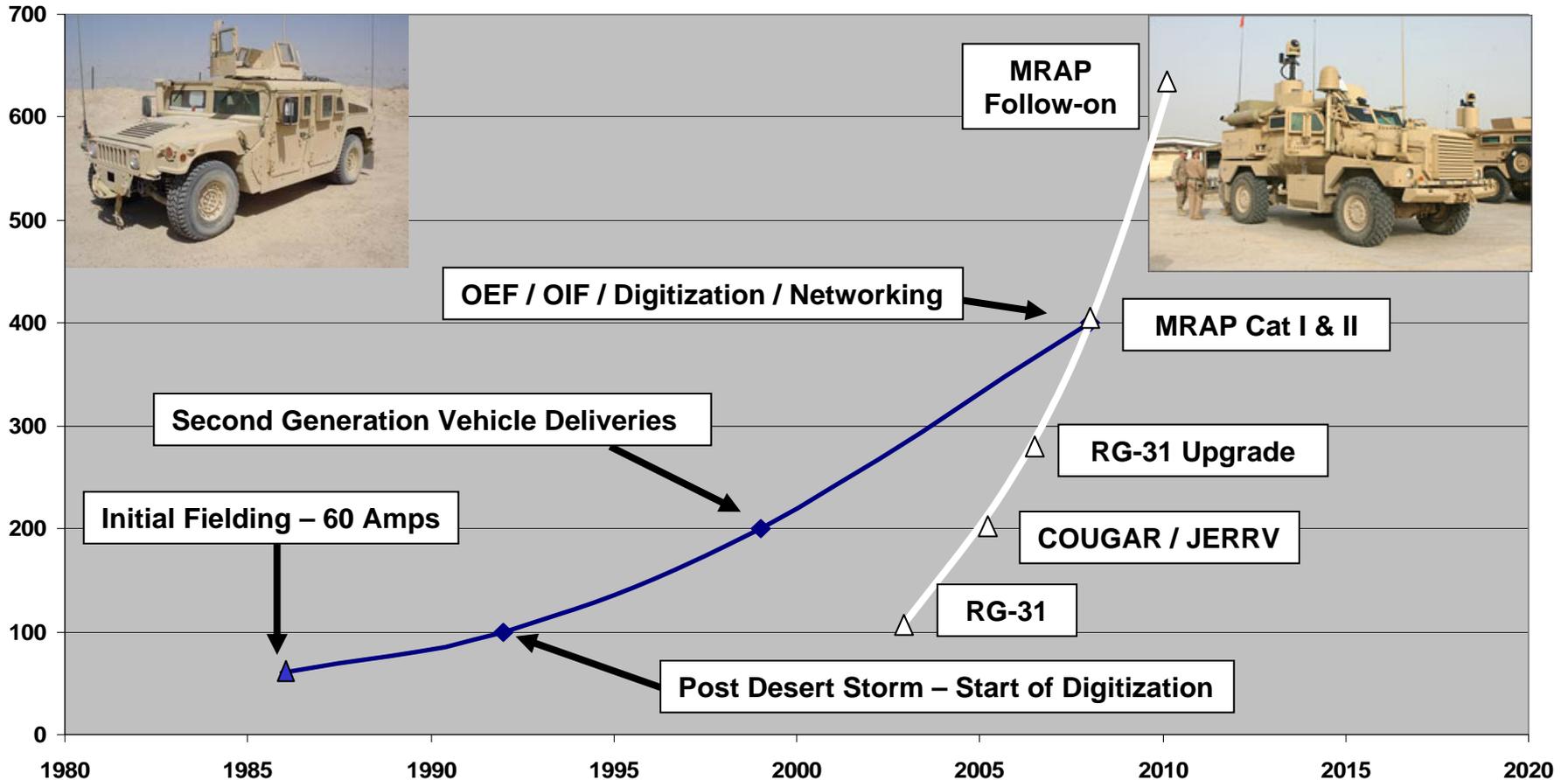
Mortar Sect

Assault Sect



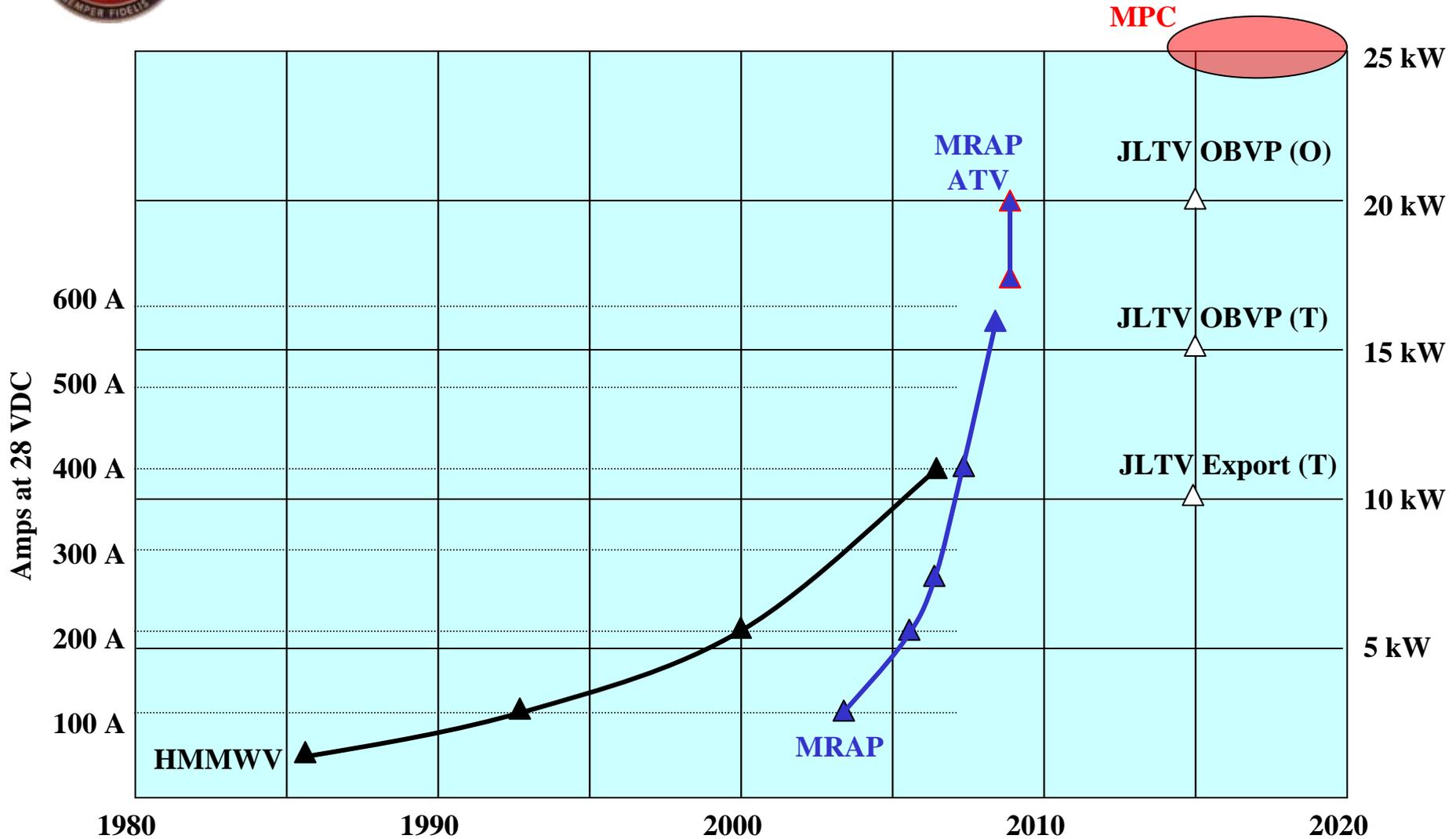
Vehicle Power Needs

Alternator Amperage Rating on HMMWV / MRAP at 28 VDC





Vehicle Power Needs





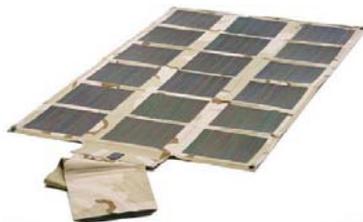
Renewable Energy Investments

Internal
< 10 Watts



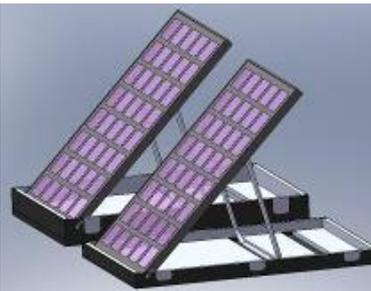
Not Feasible

Carried
10 - 100 Watts



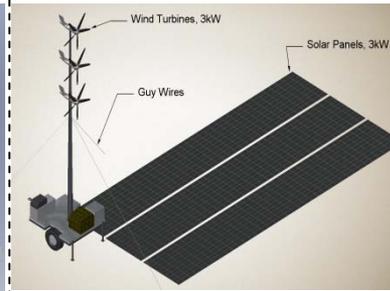
SPACES
2009/10

Portable
100 - 1000 Watts



GREEN
2010/11

Generator
1 - 100 kWatts



DREAM (2007)
TREP (2012)

Stationary
> 100 kWatts



Not Tactical



Secretary of the Navy Energy Goals

New Requirements for Acquisition Processes

- Mandatory evaluation factors used when awarding contracts for platforms, weapon systems, and buildings will include: Lifecycle energy costs, Fully-burdened cost of fuel, Contractor energy footprint

Sail the “Great Green Fleet”

- DON will demonstrate a Green Strike Group in local operations by 2012 and sail it by 2016

Reduce Petroleum Use in Non-Tactical Vehicles

- By 2015, DON will reduce petroleum use in the commercial fleet by 50%

Increase Alternative Energy Ashore

- By 2020, DON will produce at least 50 percent of shore-based energy requirements from alternative sources

Increase Alternative Energy Use Navy-wide

- By 2020, 50 percent of total DON energy consumption will come from alternative sources



Mobile Electric Power

DOD Standard Generators



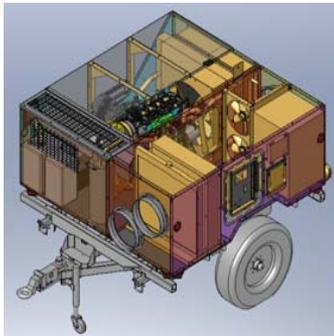
USMC Unique Generators



Tools / Customer Support



Integrated Trailer ECU - Generator



Power Distribution



Floodlight Sets





Environmental Control Equipment

Environmental Control Units



Special Customer ECUs



Field Refrigeration



**In-Field Ice Making
(food service, mortuary affairs)**



Tools / Customer Support





Advanced Power Sources

Radio Power Adaptors



Power Supplies



Renewable Energy



On-Board Power



Battery Management / Sustainment Systems





Expeditionary Power Systems Reset

TQGs 5-60 kW (Joint)

Tactical Quiet Generators (2nd Gen Military)

AMMPS 5-60 kW (Joint)

Advanced Medium Mobile Power Sources (3rd Gen)

2/3 kW MTG/TQG (Joint)

Military Tactical Generator / Tactical Quiet Generator

100 kW TQG (Joint)

Tactical Quiet Generator (2nd Gen)

MMG 25 MTG (USMC)

Military Tactical Generator (UUNS / POR)

ITEG (USMC)

Integrated Trailer-ECU-Generator (1st Gen)

ITEG II (USMC)

Integrated Trailer-ECU-Generator (2nd Gen)

Floodlight System (USMC)

(1st Gen & 2nd Gen)

MEPDIS (USMC)

Mobile Electric Power Distribution (1st Gen & 2nd Gen)

Family of ECUs (USMC)

Environmental Control Units (1st Gen & 2nd Gen)

Family of ECUs (USMC)

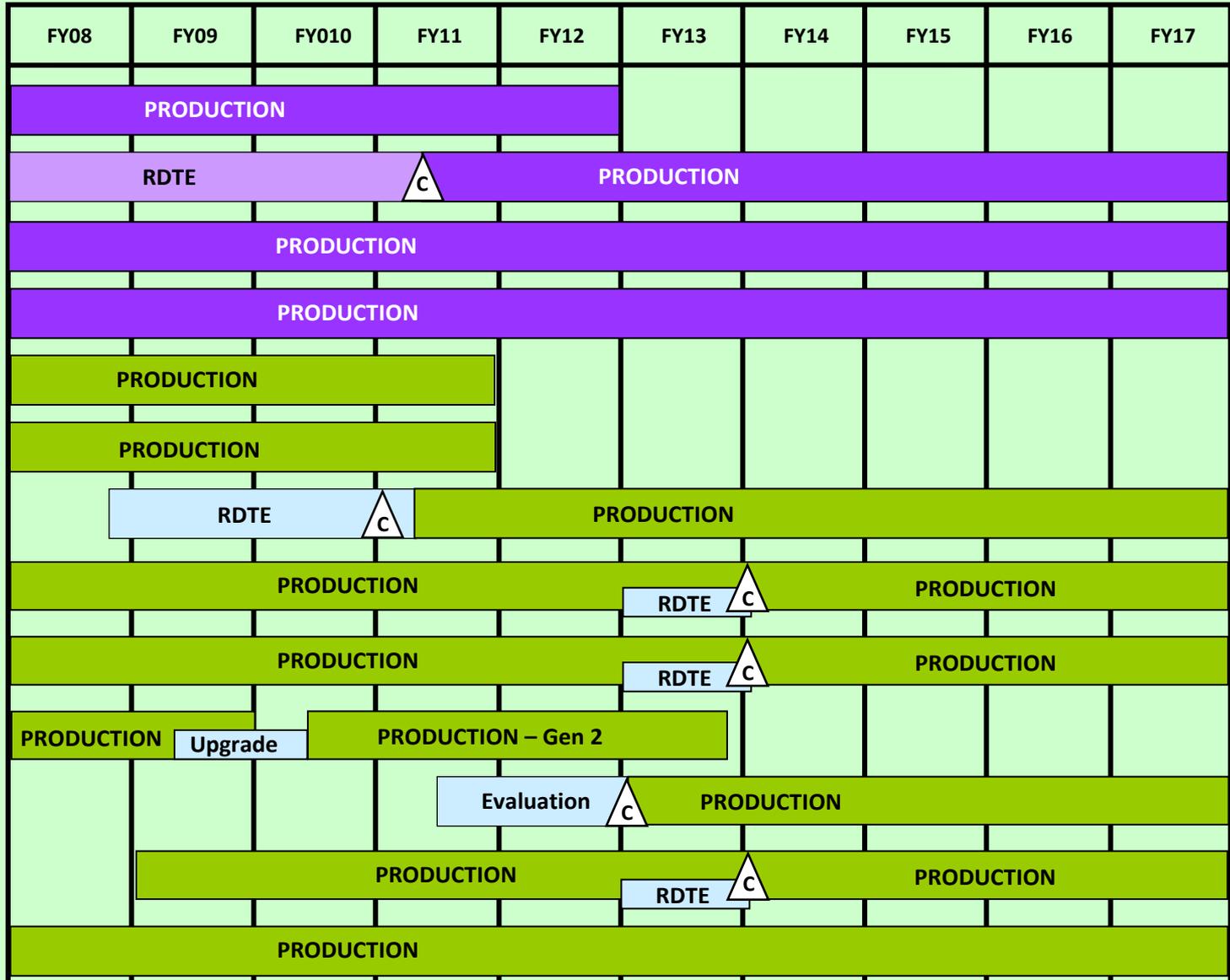
Environmental Control Units (3rd Gen)

Family of FRS (USMC)

Field Refrigeration Systems (1st Gen & 2nd Gen)

Support Equipment (USMC)

Toolsets / Loadbanks / Modification Kits (continual buy)





Expeditionary Power Systems Reset

Military Battery Chargers

- Vehicle Mounted
- Ruggedized Garrison
- Special Purpose

Lead Acid Battery Mngt

- Chargers / Analyzers
- On-site training

Radio Power Adaptors

- Hand-held
- Man-portable
- Multi-radio

Family of Power Supplies

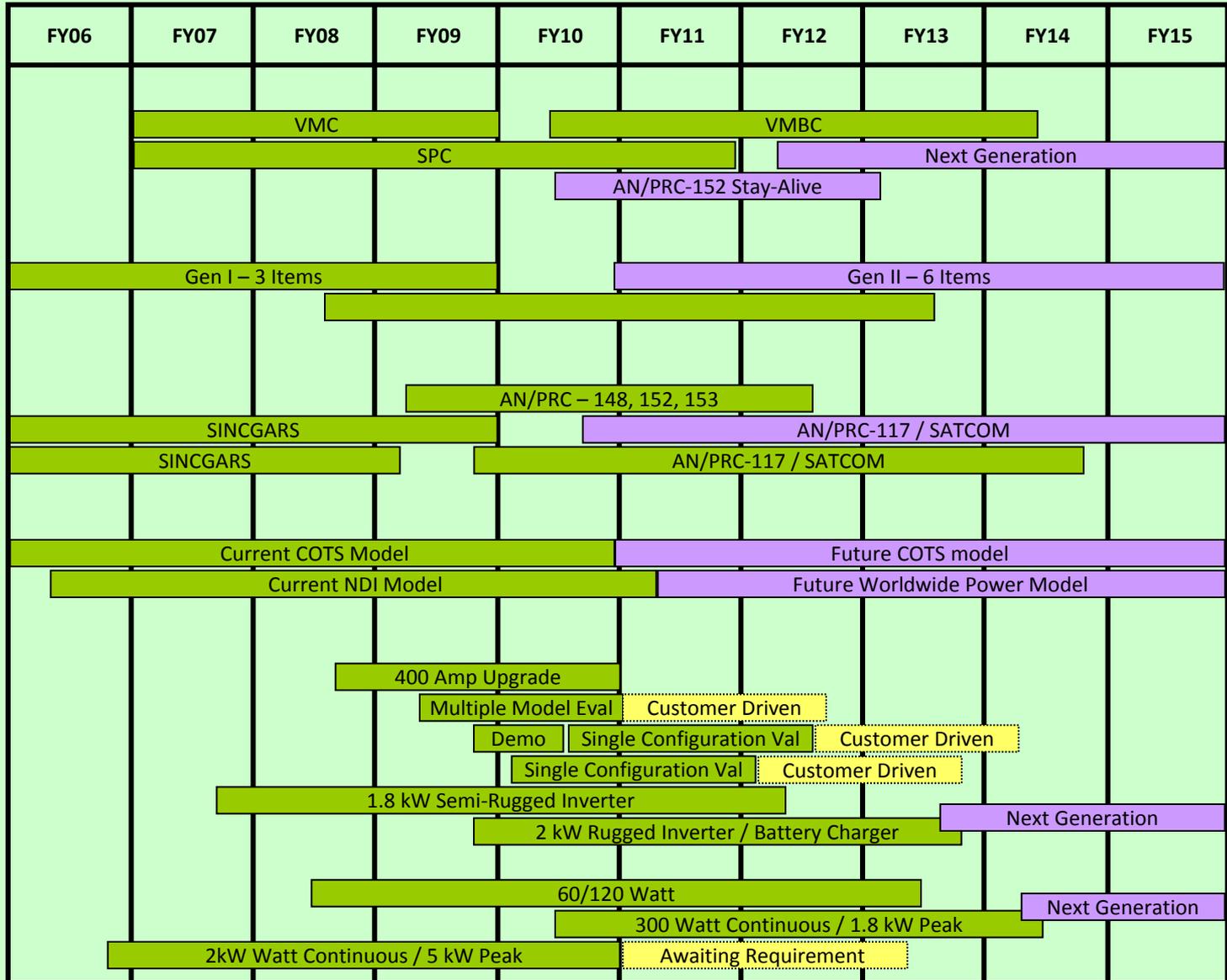
- Garrison / Benchtop
- Ruggedized

On-Board Vehicle Power

- HMMWV Upgrade
- APU
- HMMWV 30 kW
- MTRV 120 kW
- DC-AC Inverters

Renewable Energy Sources

- Man-portable (SPACES)
- Modular (GREEN)
- Trailer Mounted (DREAM)





Experimental Forward Operating Base

- **Intent:**

- Design and build scalable small to large FOB prototype
- Test, evaluation, operational experimentation with various configurations

- **First Round ExFOB Demonstrations:**

- February – March 2010
- Conducted in Quantico VA
- 90 proposals evaluated / 27 demo'd
 - Power Generation
 - Water purification, packaging, storage
 - Shelters and shelter efficiency



- **Second Round ExFOB Demonstration:**

- August 2010 in 29 Palms, CA (RFI to be released by ONR)
- Desire to address:
 - Microgrids
 - Alternative cooling methods in desert environments



Naval Lithium Battery Safety Program

- **Applies to Every Program in Department of Navy / USMC which has a lithium battery**
 - **No matter how small or how large.**
- **Approval must be obtained before the systems is:**
 - **Used by DoN/USMC personnel.**
 - **Tested with or on DoN/USMC equipment and facilities**
- **Approvals are specific to:**
 - **A battery design**
 - **A system (certain vehicle, type of radio, etc.)**
 - **A platform (surface ship, ground, sub, air)**



Naval Lithium Battery Safety Program

- **What governs the Naval Lithium Battery Safety Program**
 - **Naval Sea Systems Command Instruction**
 - **NAVSEAINST 9310.1b / Defines the Process**
 - **Naval Sea Systems Command Technical Manual**
 - **Technical Manual S9310-AQ-SAF-010 / Latest version of 19 Aug 04**
 - **Guidelines for Design, Review and Testing**
 - **MCSC Acquisition Policy Letter**
 - **Policy Letter No. 3-04 / Implements the Department of the Navy LBSP**

All documents available at www.marcorsyscom.usmc.mil/sites/pmeps

Who Are The Players?



- **Approvals Granted by – NOSSA**
 - **Naval Ordnance Safety and Security Activity, Code N841**
- **Special Authority for Specific Platform Use:**
 - **NAVSEA Code 07T2 for Submarine Carriage**
 - **NAVAIR 4.4.4.1 for Aircraft Carriage**
- **Primary Testing and Evaluation Sites**
 - **Carderock Division, NSWC, Code 616**
 - **Crane Division, NSWC, Code 609**
- **PM-Expeditionary Power Systems (EPS) is USMC focal point**



Exceptions and Exemptions

(TM-S9310 Section 1.3)

- **Exemption - Lithium Ion Batteries Used in COTS**
 - UL listed, unmodified electronics using OEM charging device
 - No more than 18 V (≤ 4 series cells)
 - No more than 100 Wh
- **Exemption - Coin Cells (Naval Msg 011731Z MAR 06)**
 - Commercial available cell, in unmodified device
 - Single primary cell configuration
 - ≤ 3 volt
 - ≤ 1 Ah capacity
- **Exception - Small \leq Two Identical Primary Cell Applications (non-rechargeable)**
 - No more than 1.5 Ah/cell
 - COTS Item :
 - must be UL listed and unmodified
 - Navy Specific item:
 - No other source of power or electrically protected (i.e. diodes)



Acquisition Opportunities

- **Next Generation, Self-contained, Tactically Deployable Floodlight**
- **Mobile Electric Power Distribution System Rebuy**
- **Family of Environmental Control Units**
- **Ruggedized Suitcase Battery Chargers (military batteries)**
- **Special Purpose Battery Charger (AN/PRC-152 battery in storage)**
- **Lead Acid Battery Chargers / Analyzers**
- **AN/PRC-117F/G Radio Power Adaptors**
- **Commercial Benchtop / Lab Power Supply**
- **Ruggedized Power Supply with Worldwide Power Input**
- **Improved Battery System (large format, high energy density)**
- **On-Board ship battery storage / charging / self-containment**
- **Tactical Renewable Energy Program (TREP - Trailer Mounted) – ONR BAA**
- **Tactical Generator Microgrid - ONR BAA**
- **ExFOB Hardware Demonstration - ONR RFI – Late May**



Acquisition Opportunities

- **Keep your eyes on FedBizOpps and GSA Advantage**
- **Sources Sought / RFI notices will precede official RFP**
- **Will follow Acquisition Guidelines for source of supply**
 - **Mandated sources**
 - **Federal Schedules**
 - **Small Businesses / Disadvantaged Businesses**
 - **Open Competition**
 - **Limited Competition**

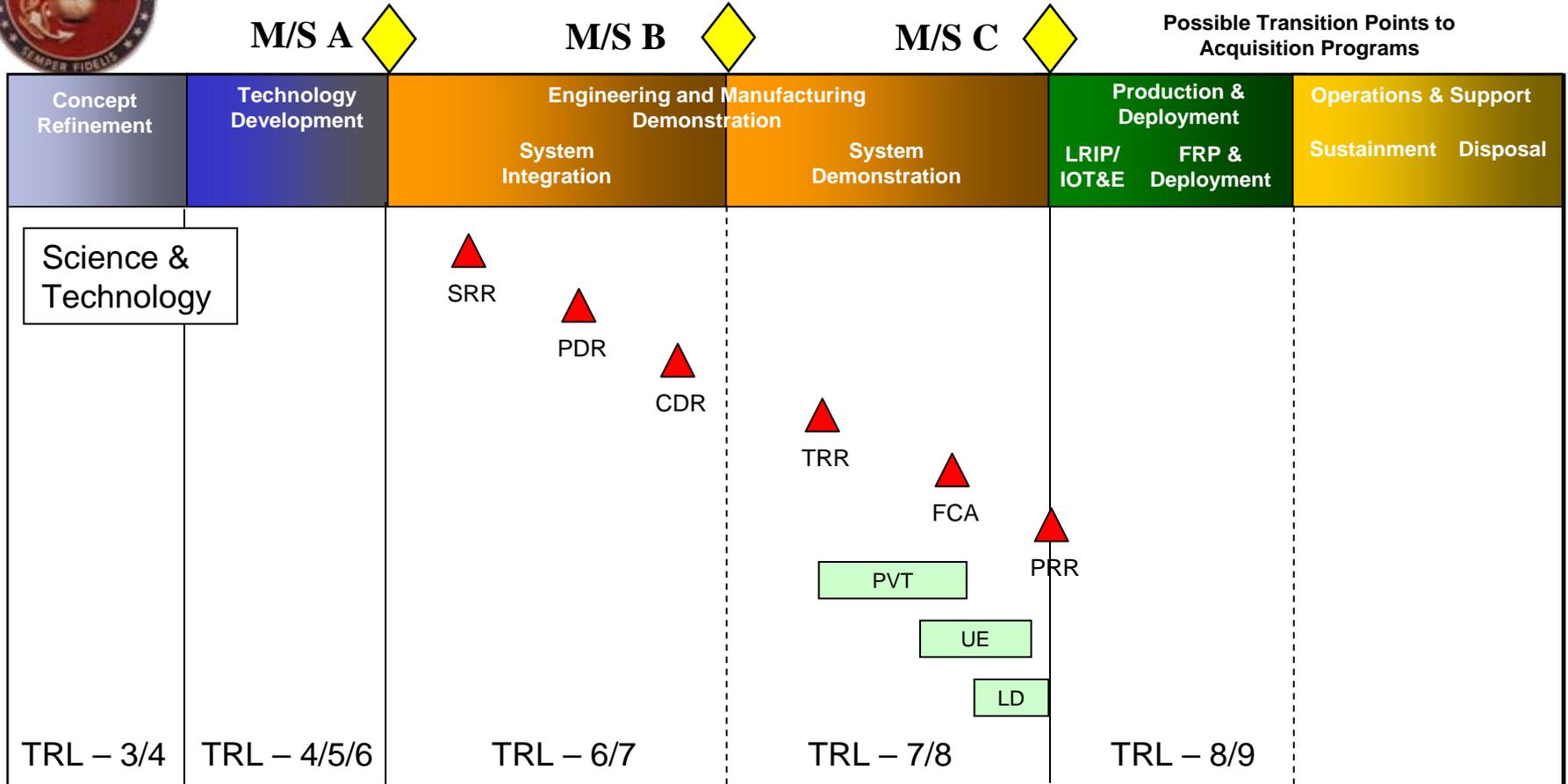


Acquisition Strategies

	Joint	USMC Dev'1	USMC Non-Dev'1
<ul style="list-style-type: none"> ▪ Radio Power Adaptors ▪ Battery Management and Sustainment Systems ▪ Solar / Renewable Power Adaptors ▪ On-Board Vehicle Power Systems ▪ Family of Power Supplies ▪ Mobile Electric Power Generating Sources ▪ Lightweight Man-Portable Generator ▪ Mobile Electric Power Distribution ▪ Field Wiring Harness ▪ Floodlights ▪ OIF 15/22 kW HMMWV Towable Generator ▪ Generator Synchronizing Unit ▪ Electrician Toolkit ▪ Generator Loadbank ▪ Lithium Battery Systems / Safety Systems 	<p>X</p>	<p>X</p>	<p>X</p> <p>X</p> <p></p> <p></p> <p>X</p> <p></p> <p></p> <p></p> <p></p> <p>X</p> <p></p> <p></p> <p></p> <p>X</p>



Acquisition Phases

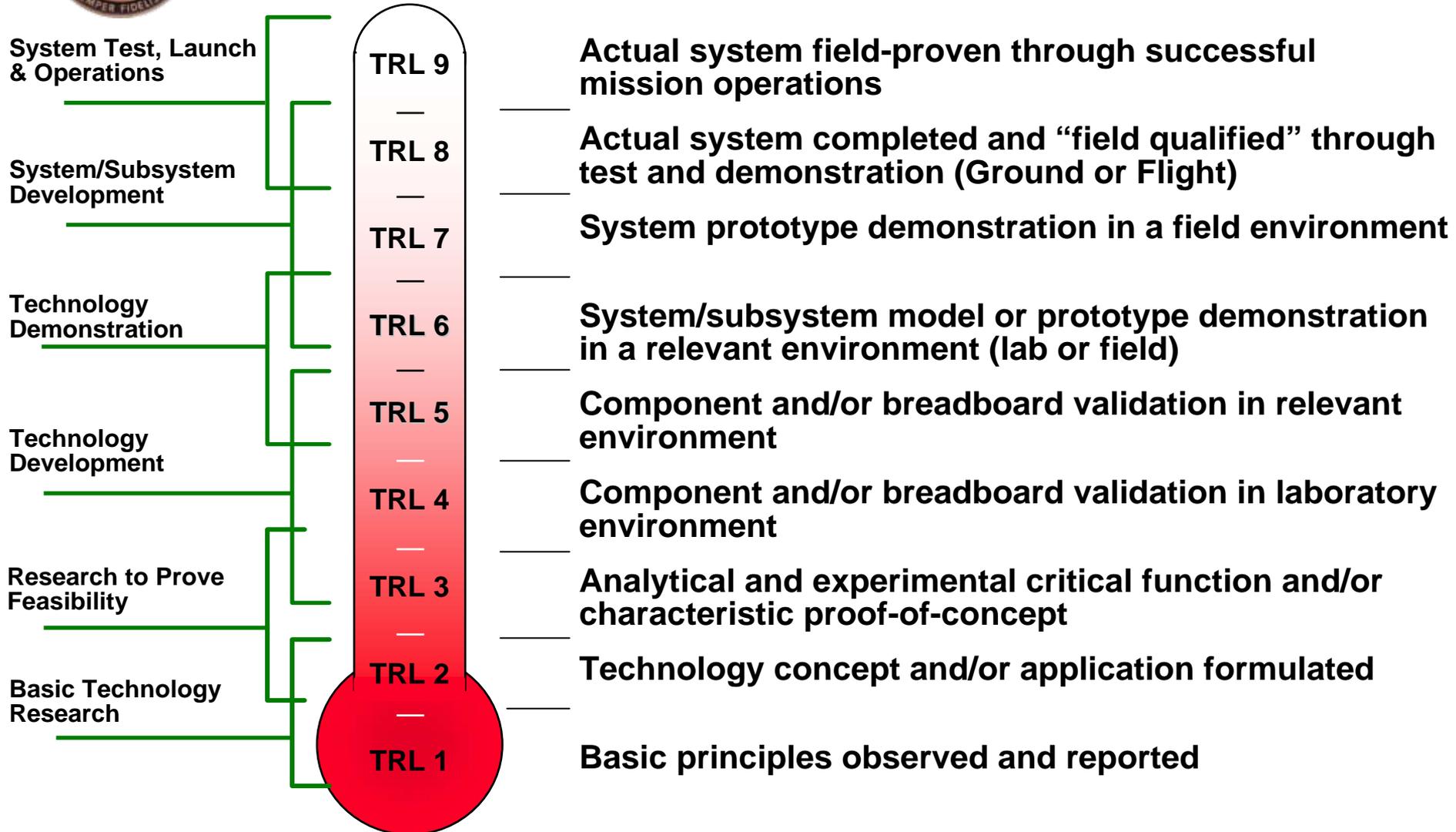


CDR - Critical Design Review
 FCA - Functional Configuration Audit
 FRP - Full Rate Production
 IOT&E - Initial Operation Test & Evaluation
 LD - Logistics Demonstration
 LRIP - Low Rate Initial Product
 PAC - Post Award Conference

PDR - Preliminary Design Review
 PRR - Production Readiness Review
 PVT - Production Verification Testing
 SRR - System Requirements Review
 S&T - Science and Technology
 TRR - Test Readiness Review
 UE - User Evaluation



Technology Readiness Levels





Acquisition Planning

- **Business Strategy**
 - How fast are items needed?
 - How defined, understood and available is the end item?
 - How often are items needed (One-time-buy, Life-of-item buy, Interim solution)?
 - Who is the customer? (defined, varied, unpredictable)
 - Joint Service interests / Other service lead / USMC lead

- **Acquisition Strategy**
 - Market Research should define / focus the strategy
 - Method for Performance Specification
 - Method for Work Scope Specification

- **Contracting Strategy**
 - Streamlined Acquisition
 - Commercial Item procurement
 - Competitive vs Sole Source Procurement
 - Federal Supply Schedule procurement (GSA)
 - Military Interdepartmental Procurement Request (MIPR)



Specifications / Statements of Work

Specification Types

- **Performance Specification (MIL-PRF)**
- **Program Unique Specification**
- **Military Standard (MIL-STD)**



You build
to our
spec

- **Purchase Description**
- **Commercial Item Descriptions (CIDs)**



You tell us
what you
will build

Work Statement Types (MIL-HDBK-245D for guidance)

- **Statement of Work** - Do as I say
- **Statement of Objectives** - You tell me
- **Broad Agency Announcement** - You tell me

In Closing.....



- Points of Contact:

- Program Manager: michael.a.gallagher@usmc.mil
- Mobile Power / ECU Team Lead: robert.h.mckenzie@usmc.mil
- Advanced Power Team Lead: malar.motley@usmc.mil
- Lead Engineer: jonathan.carpenter@usmc.mil
- Capabilities Officer: clifton.harris@usmc.mil

Questions?